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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/060,944	01/30/2002	Naoki Kikuchi	116-012136	7271

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EXAMINER

HASHMI, ZIA R

ART UNIT PAPER NUMBER

2881

DATE MAILED: 05/09/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/060,944

Applicant(s)

KIKUCHI ET AL.

Examiner

Zia R. Hashmi

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 30 January 2002.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-24 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-24 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Independent claims 1-3, 7, 10, and 13, and dependent claims 4, 5, 8, 11, 14, 16, and 18-19 are rejected under U.S.C. 102(e) as being anticipated by Ishimoto

(Pub No: US 2001/0022345 A1).

3. With respect to independent claims 1-3, 7, 10 and 13, and dependent claims 4, 5, 8, 11, 14, 16, and 18-19, Ishimoto discloses a method of inspecting a hole using a charged-particle beam (Abstract, lines 1-2, paras 0002,0011 and 0012), comprising steps of irradiating the hole with a charged-particle beam, the hole being formed in an etched layer on a substrate forming a sample to be inspected (Abstract, lines 3-5 and para 0012), detecting an electric current flowing between the inspected sample and ground as a result of the irradiation (Abstract, lines 5-6, para 0012, lines 10-13, and Fig. 1), finding etch depth of the hole into the inspected sample based on the relation of the

current flowing between the reference sample (para 0012), lines 13-15) and the ground to the etched depths of the holes into the substrate (para 0010, lines 9-14), the relation being previously found using reference sample (paras 0012, 0020, 0027, and claim 1 in para 0037). Ishimoto also discloses method of inspecting etched hole (para 0010, lines 9-10), based on relations of the current flowing between a reference sample and ground , the relations being previously found using the reference sample (paras 0007 and 0029), and classifying these etch depths into plural groups, and then finding which of groups does the currently inspected etch depth belong based on the detected electric current flowing between the inspected sample and ground (para 0012, lines 10-19, paras 0023, 0029, and claim 3 in para 0037). Ishimoto also discloses a method of judging whether the hole in the inspected region is precisely etched by measuring currents (para 0018, lines 3-17, para 0019, lines 1-5 & 8-11, paras 0007, and 0012). In addition, his method discloses means of obtaining data about a distribution of etch depths and degrees of etching (paras 0029 and 0030) of the holes in the inspected sample into substrate, based on the detected current and on a relation of detected current flowing between the reference sample and ground to etch depth of the hole into the substrate, the relation being previously found using the reference sample (para 0012, lines 1-19, para 0020, lines 1-17, and para 0030), wherein each of the plural regions is selected so that plural holes are contained therein (para 0020, lines 11-13); and displaying a map based on the obtained data about the distribution on a display unit (para 0012, lines 17-19, para 0023, lines 1-14, para 0030, and Fig. 2 & 4). Furthermore, groups are displayed in different colors, or with different brightness levels

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(para 0028, lines 4-10 & 14-16).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 6, 9, 12, 15-17, and 20-24 are rejected under U.S.C. 103(a) as being unpatentable over Ishimoto (Pub. No; US 2001/0022345 A1). Ishimoto, however, fails to disclose method of creating graphs indicative of the characteristics of the currents flowing through the regions of the reference sample and unknown sample, and displaying such graphs side by side on a display unit, or depict different pieces of information in terms of characters in a map.

It would have been obvious to one having ordinary skill in the art at the time of the invention was made to added the above-mentioned features to Ishimoto's method and apparatus. The examiner has taken notice that such improvements are within the limitations of Ishimoto's invention (paras 0012, 0020 and 0023).

Conclusion


6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Yamada et al. disclose (Pub. No : US 2002/0070738 A1) a semiconductor device inspection apparatus capable of high-precision inspection using current flows through the semiconductor.

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7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Zia Hashmi whose telephone number is (703) 305-0419. The examiner can normally be reached between 8.30 AM- 5 PM. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John. R.Lee can be reached on (703) 308-4116.

Zia Hashmi

April 9, 2003


JOHN R. LEE
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800